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THE

ALDEN PROCESS

OF

PRESERVING AND PERFECTING

Fruits, Vegetables, Meats, Fish,

&c.,

BY PNEUMATIC EVAPORATION AND
SUPER-MATURATION.

Alden fruit-preserving company



ALDEN FRUIT-PRESERVING COMPANY,
123 Chambers Street.
NEW YORK.

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THE

A LOST PROGRESS

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PRINTED BY LANGE & HILLMAN,
AT 207 PEARL STREET, NEW YORK.

THE ALDEN PROCESS.

THE recently matured discoveries of Mr. CHARLES ALDEN, of Newburgh, N. Y. (original inventor of the well-known condensing and desiccating processes), in the perfecting, refining, and preserving of organic products, open to mankind a new realm of knowledge and power, with new and illimitable ranges of profitable enterprise.

It may be said with all sobriety and restraint, that the Alden Process of Pneumatic Evaporation and Super-maturation adds from fifty to one hundred per cent. to the production available from every acre of soil, apart from cereals, and excepting the few acres that are profitably devoted to market gardening in the vicinity of cities.

Whether we consider the magnitude, the profit, the security, or the facility, of operations under the Alden patents, a searching examination will disclose no other line of enterprise ever yet opened so justly alluring to active business men, whether with large or small capital.

To owners of farm lands, the Alden Evaporator is better than a railroad, and equal to a city neighborhood. In any secluded locality, this provision for realizing on the more lucrative but perishable crops, could hardly fail to raise the value of tillable lands by twenty-five per cent. With its aid many novel and delicious forms of food are developed, and all grades of soil and climate will now produce crops of the richest character, heretofore impracticable or worthless except in favored localities.

We can here enter but sparingly into the explanation and proof of these statements, inviting, rather, those interested to call at the office of the Alden Fruit Preserving Company, No. 123 Chambers street, and verify whatever seems most incredible, by examining the products for themselves. For those, again, who prefer to base their opinion of results upon a philosophical knowledge of causes, we have in preparation a full explanation of the chemical effect of pneumatic evaporation upon the succulent food elements of plants, together with a Report of high authority on the comparative chemical analyses of the Alden and other fruits and vegetables, made by the eminent organic chemist, Dr. St. Krackowizer, of Vienna, and now of

16.62 water, **23.08** sugar, and 60.30 other matters; total, 100. The mucous matter, &c., had lost 9.80 parts (14 per cent.), and the sugar had gained 4.33, or over 23 per cent.*

The superior richness therein demonstrated, and confirmed by the testimony of the senses, with the great saving in sugar attending the use of the Alden fruits, would suffice alone to assure to the manufacturer a higher price than fruits and vegetables command when preserved in a cumbrous, hazardous, *quasi* fresh state, or in the more ordinary dried and deteriorated form. But when we add to these advantages the *undeniable* FRESHNESS of the Alden products, in all their compactness and portability, requiring only the addition of pure water to yield fresh fruit for pies, sauces, and puddings, and fresh vegetables and salads for the table, at any season, or at any point on the globe, whether in the midst of the Great Desert, on the vast ocean, or in Arctic snows, it becomes abundantly certain that the demand for these products must increase much faster than it would be physically possible for capital, labor, and land to supply them, and that prices, for a generation to come, must rule high for domestic and foreign markets, in comparison with any pre-existing forms of preserved fruits and vegetables; and yet not high in comparison with their green equivalents as now marketed, to a limited extent and for short seasons, in populous localities.

We subjoin some of the commercial data thus far obtained by

* ANALYSIS—From Prof. Krackowizer's Report: column No. 1, giving the proportions of the several constituents in 500 parts fresh Baldwin apples—No. 2, the proportions obtained from a similar quantity of *the same lot of fruit* after being reduced to 100 parts (losing 400 parts of water) by "dessication" with a patent steam apparatus, in the finest possible manner—No. 3, the proportions obtained from a like quantity of *the same lot of fruit* after being reduced and preserved by THE ALDEN PROCESS OF PNEUMATIC EVAPORATION:

	FRESH.	DESICCATED.	(ALDEN).
Water (free or bound).....	411.15	12.42	16.62
Cellulose, or fibrous skeleton of the fruit.....	9.60	10.54	10.22
Amylaceous cellulose (analogous to starch).....	32.95	30.95	29.75
Protein (analogous to albumen).....	.75	.80	.76
Pectine (analogous to gelatine).....	12.35	11.35	10.88
Bassorin (gummy matter).....	6.75	7.22	4.33
Acids (tartaric, citric, formic, malic, and traces of oxalic).....	6.70	4.88	3.43
Mineral matter.....	.85	.87	.78
Chlorophyl and extracts.....	.15	.12	.15
Essential ethyls (imponderable traces).....	0.00	0.00	0.00
Dextrine (starch gum).....	0.00	2.10	0.00
Grape Sugar.....	18.75	18.75	23.08
	500.00	100.00	100.00

N.B.—The item of dextrine, or starch gum, peculiar to the desiccated fruit, is due (says the Professor) *to the influence of dry heat*, and is practically a dead loss in all preservation by means of dry heat. The absence of this item in the Alden fruit, as well as the presence of 4.20 extra parts of water (chemically bound, as *hydrate*), exhibits the influence of the HUMIDITY, which is an important chemical agent, in the Alden Pneumatic blast.

careful experiment upon a variety of leading articles; pledging ourselves that those who may be induced to verify these data for themselves will find them not exaggerated, but well within bounds, even where most astonishing in appearance.

Operations of One Evaporator, per Week.

ON APPLES.

ONE Evaporator of 40 frames, carrying $\frac{1}{2}$ bushel per frame, 2 frames entering and coming out every 9 minutes, makes 160 frames, or 80 bushels, in 12 hours. Total, say 500 bushels per week, running half time; or, 1,000 bushels, running full time.

500 bushels, 50 lbs. each—25,000 lbs.; less 80 per cent. water, leaves	
10 lbs. dehydrated fruit per bushel, or 5,000 lbs. per week (half time);	
average, 15 cts. per lb.....	\$750 00
Cost, $4\frac{1}{2}$ cts. per lb., as follows: 500 bushels apples, at 25 cts..	\$125 00
3 girls on paring-machines,	} 11 girls, at \$5..... 55 00
1 girl on slicing-machine,	
6 girls spreading fruit on frames,	
1 girl taking off " " "	
Engineer, \$12; man, \$9; boy, \$6.....	27 00
3 tons coal, \$7.....	21 00
Rent, interest, etc.....	10 00
	<u>\$238 00</u>
Net profit per week, half time.....	\$512 00
" " full time.....	1,024 00

In case apples cost 50 cts. per bushel, net profits will be \$337 to \$774. Results at any given price for fruit may be readily calculated by considering the total for all other expenses as 23 cts. per bushel, or $2\frac{1}{2}$ cts. per lb. of evaporated fruit—cheaper than it can be home-dried in the most ordinary manner!

NOTE.—One-fifth, or 2 lbs. per bushel, of the above product, consists of cores and skins, dehydrated separately, and sold for making jelly. Allowing these to go into the total, reduces the average price to 12 cts., as given. Or, calling the pure Alden apple $17\frac{1}{2}$ cts. per lb. (we have not been able to supply a tithe of the wholesale demand at *twenty* cts.), and the cores and skins 6 cts., comes to the same thing. If the cores and skins be made into jelly and marmalade (under Mr. Alden's Improved Exhausting Process), they will yield 30 per cent. heavy jelly, *without sugar*, or 300 lbs. (half time) per week, at an extra cost, of, at most, 5 cts. per lb., and worth, in first hands, at least 75 cts., or \$210, *net*. The residuum is entirely soluble, except hulls, and, if treated with fruit acids and sugar, will make excellent marmalade, or "apple butter," yielding at least 10 cts. per lb., *net*, for say 700 lbs., \$42. Total, \$252 *net*, from the manufacture of 1,000 lbs. cores and skins. This is over 25 cts. per lb.; showing, that 6 cts. per lb., as a factory price for the raw material, is well within bounds. Instead of

marmalade, however, a new and luscious conserve, called *fruit cheese*, will probably absorb the residuum of apples, peaches, etc., in the future.

N. B.—The jelly here meant is not the common jelly of commerce, but a concentrated article, requiring no sugar or other substance, or boiling, for its manufacture and preservation. To make an equivalent for the ordinary jelly, retailed at \$1 per lb., at least 10 lbs. of water, with sugar, should be added to every pound of the concentrated jelly. Or, to imitate that article more precisely, if desired, add 30 lbs. sugar to the pound of concentrated jelly, with water enough for solution, fruit acids, flavors, gelatine, etc., raising the quantity to, say, 50 lbs., on the basis of 1 lb. pure apple jelly.

N. B., 2.—Small, gnarled, and windfall fruit, usually wasted, will yield, per bushel, 3 lbs. jelly, \$2.25, or, say, \$2.50, net, with net value of residuum for marmalade. The product of a week's work on this description of fruit would therefore be worth \$1,250, while the fruit would only cost half price, and the cost of paring would also be saved.

ON PEACHES.

PARTICULARS the same as with apples, except the reduction of fruit by evaporation and pits is 84 per cent., leaving (from fair, good-sized peaches) 8 lbs. per bushel of 50 lbs. 500 bushels per week (half time) yield 4,000 lbs. dehydrated fruit, averaging 30 cts.—\$1,200; and 750 lbs. skins, worth, for jelly and marmalade, 6 cts. per lb.—\$45. Total, \$1,245.

COST.—500 bushels, at 50 cts., is \$250; expenses, as before, \$113; with 10 girls extra, for paring and slicing, \$50. Total cost, \$413; or, about 10 cts. per lb. Net profit per week, half time, \$832. Net profit per week, full time, \$1,664.

In case peaches cost 75 cts. per bushel, profits will be \$707 to \$1,414. Peaches worth \$1 per bushel will yield choice fruit at a more than compensating extra price.

ON TOMATOES.

At 60 lbs. per bushel, losing $93\frac{1}{2}$ per cent. water and waste, making 4 lbs. dehydrated fruit, and requiring about twice the time of apples and peaches, the consumption and product per week are:

250 bushels, making 1,000 lbs., at 75 cts.	\$750 00
Cost: 19 cts per lb., viz.: 250 bushels, at 35 cts.	\$87 50
Evaporation, etc. (10 girls and 1 man).....	102 00
	<hr/>
Net profit per week, half time.....	\$560 50
“ “ full time.....	1,121 00

NOTE.—The price placed upon this new article (compressed in solid cakes) compares thus with that of canned tomatoes, inferior to it in quality and fitness for exportation to distant markets: 1 lb. of Alden tomatoes is equal to 6 qts. canned tomatoes; and 75 cts. per lb. for the former is therefore equivalent to $12\frac{1}{2}$ cts. per qt. can, or \$1.50 per dozen, for the latter—a price at which it would be impossible to purchase them from first hands, and on the largest scale.

ON SWEET POTATOES.

THIS vegetable requires one-third more time for evaporating than apples, and will turn out 360 bushels per week, half time. At 60 lbs. per bushel, losing 70 per cent. water and refuse, and yielding 18 lbs. dehydrated vegetable, the weekly work will be:

360 bushels, 6,480 lbs. (dehydrated), 10 cts.	\$648 00
Cost: $3\frac{1}{2}$ cts. per lb., viz: 360 bushels, at 40 cts.,	\$144 00
“ Evaporation, etc., with 16 girls	138 00
	<hr/>
Net profit per week, half time,	\$366 00
“ “ full time,	732 00

This article will find unlimited market throughout the world at all seasons of the year, and in most countries will be a luxury as novel as delicious, retaining, as it does, all the properties of the sweet potato in perfection, and requiring only a few hours in pure water to be ready for frying, or cooking by steam.

Mention may properly be made here of the delicious syrup obtained from the dehydrated sweet potato, at a trifling expense, by Mr. Alden's patent exhausting process. The yield is over one gallon per bushel, of the heaviest and richest quality, 11 lbs. to the gallon. The average product per acre is 500 bushels, yielding, at only \$1 per gallon, \$500 in syrup, and a residuum of 5,000 lbs. flour, worth at least \$150. The cost of manufacture, without paring, need not exceed the value of the flour, leaving the syrup, \$500, as the annual clear product of tillage per acre.

This syrup is pronounced by all who have tasted it the finest article ever yet known. The manufacture of the sugar is as yet undeveloped; but, in preserved sweet potatoes, syrup, and flour, to go no further, our Southern States will find at once a product and a market practically illimitable, and that must, ere long, rival their cotton itself in aggregate value, while greatly surpassing it in profit. The flour makes delicious griddle or batter cakes, puddings, pies, and bread, and it is believed will yet become one of the most popular and important of breadstuffs.

ON PUMPKINS AND SQUASHES.

1,440 pumpkins, averaging 15 lbs., losing $93\frac{1}{3}$ per cent. water and refuse, yield 1 lb. each dehydrated pumpkin, 1,440 lbs., 30 cts.		\$432 00
Cost: 13 cts per lb., viz: 1,440 pumpkins at 4 cts.	\$57 60	
Manipulating and evaporation (14 girls)....	132 00	189 60
	<hr/>	
Net profit per week, half time,		\$242 40
“ “ full time,		484 80
Season, say 17 weeks. Total.....		\$8,241 60

In the case of this vegetable, also, the price paid the farmer gives him a very profitable crop in northern climates, and without engrossing land for other purposes. In reckoning purely agricultural profits, per acre, this crop, (1,000 pumpkins, \$40), and that of sweet corn, hereafter stated (\$60), should be added together, making \$100.

To the evaporating season for pumpkins above should also be added two months on *summer squashes*, which will add another new summer delicacy for the table all the year and world around, and will raise the season's work to over \$12,000.

The most important consideration on this part of the subject remains to be stated. *The pumpkin will rival the beet in the production of sugar*, through the aid of the Alden processes. It has a large percentage of saccharine matter naturally, besides a rich supply of mucus for conversion to sugar by super-maturation. Sugar is undoubtedly destined to become, by means of this great discovery, a product more universal, and hardly less abundant and cheap than wheat or Indian corn.

The winter squash gives data somewhat different from the pumpkin. A week's work (half time), 1,440 squashes, costing 10 cents each, will make 1,800 lbs., 35 cts.—\$630. Cost of evaporation, \$237, and profit \$393; or full time, \$786.

ON SWEET CORN.

76,800 ears per week, or 19,200 lbs. off cob, give		
9,600 lbs. preserved at 10 cts.		\$960 00
Cost: $4\frac{1}{2}$ cts. per lb., viz.: 76,800 ears at 30		
cts. per 100.....	\$230 40	
Expenses (30 girls).....	208 00	438 40
		<hr/>
Net profit per week, half time,		\$521 60
“ “ full time,		1,043 20

Evaporating on cob will save cost in hands, and afford an article to be preferred by many, as undistinguishable on the table from summer green corn.

This crop will yield 4 good ears per hill from 5,000 hills per acre; 20,000 ears, \$60, besides imperfect ears and green fodder worth fully the cost of the whole crop, and pumpkins, as above, \$40; total, \$100 net profit per acre to the farmer.

GRAPES, CURRANTS, BLACKBERRIES, CHERRIES, AND SMALL FRUITS GENERALLY.

Grapes, currants, etc., are beautifully raisined by pneumatic evaporation, and from this condition extracts are drawn with great

facility, producing improved descriptions of syrups, from which, with an addition of *grape sugar* (to be manufactured also by Alden processes from the common potato), it is believed that wines and other beverages will now be available from our own fruits which will compare favorably with the majority of those imported.

The green currant and gooseberry, after evaporation, will be available the year round and in all markets for making pies of the precise flavor characteristic of those fruits, and so much preferred by many persons. The ripe currant raisin will now prove a rich and novel article for pies as well as puddings.

All the small fruits are dehydrated and preserved in a superior manner, and from the blackberry or cherry a concentration is made which will produce at a few hours' notice, anywhere (with the addition of alcohol, water, and sugar), a blackberry brandy, or cherry rum, of the finest possible quality.

MISCELLANEOUS.

All kinds of salads and delicate vegetables, such as onions, asparagus, cabbages, celery, spinach, peas, Lima beans, and others already named, are preserved fresh and dehydrated for all seasons of the year and all markets of the world, returning at any time, in water, to their original color, flavor, and other properties.

Roots, as potatoes, turnips, parsnips and carrots, are greatly improved in sweetness and purity of flavor, while reduced to a compact, portable, and imperishable form.

The manufacture of grape sugar from the starch of the common potato, and of cane, beet, sorghum and other sugars, will be greatly increased in productiveness and quality, while cheapened in cost, by the aid of the Alden processes.

The curing of tobacco and hops, and the drying of glue, are important branches of manufacture to which this process must be applied, saving a vast amount of waste, deterioration, and outright sacrifice of materials, incident to the present methods, and rendering the operations rapid, cheap, and certain.

Beef, pork, mutton, and fish, will yet be cured by this method exclusively, saving the immense consumption (waste) of salt, and the loss of fully 33 per cent. nutriment, now destroyed directly by the action of the salt; and very much increasing both the demand and supply in preserved meats and fish. These animal products are sweet, rich, and proof against decay.

Fine specimens of dehydrated clams have been obtained by this process, making equally fresh-flavored and delicious soup and chowder with the fresh article, and fitted for indefinite preservation in any climate.

THE APPARATUS.

THE chief mechanical parts are (1) the evaporating or pneumatic chamber, ordinarily 5 feet square and 15 feet high; (2) the revolving endless chains, one at each corner of the chamber, running vertically and carrying brackets to support the fruit frames, nine inches apart, and each carrying half a bushel of fruit; (3) the steam coil at the bottom of the chamber, containing about 3,000 feet of pipe, connected with a boiler, for heating the air blast; (4) the boiler and engine for driving the blower; (5) the blower. The fruit enters at the top of the chamber, where the air blast issues out in a tepid and slightly humid state from having passed through twenty to forty frames of fruit. This blast here takes off the surface moisture from the fruit quickly, but not so perfectly as to encrust it. At every nine minutes the carrying chains move the whole series of fruit-frames downward in the chamber, by the depth of one interval or two, according to the moisture of the fruit, two frames at the bottom being taken out and two freshly filled being put in at the top. As the fruit descends the blast becomes gradually warmer and freer from humidity, until its highest temperature is found at the lowest interval, where it is from 160 to 175 degrees Fahrenheit. The cost of the entire apparatus above described is \$2,500. The necessary buildings will of course vary in cost with the nature and extent of the operations, but need not be of an expensive character. Where available water or steam power is already in operation, the above cost will be diminished accordingly.

THE ALDEN FRUIT-PRESERVING COMPANY

HAS been organized by substantial and prudent business men, for the purpose of manufacturing the machinery and selling territorial rights. Their office and warerooms are at No. 123 Chambers Street, where samples of a variety of preserved fruits and vegetables may be seen, and information freely afforded, terms of royalty stated, whether on produce or territory, etc. The rights for a number of States have already been bespoken, and an active inquiry is coming in from all quarters.

A Company in Trenton, N. J., have purchased the right for Mercer County, and are putting up a large establishment in that city, capable of turning out 20,000 lbs. of evaporated fruit or vegetables per week. Another Company at Neshanic, N. J., have invested \$12,000 to \$15,000 in apparatus and buildings, which will be in operation by the 1st of May.

Other parties have purchased the right and machinery for ~~Clare~~ ~~Co.~~ ~~County~~, N. J., to evaporate the water from clams. Companies have also been formed, and counties purchased in this State, as also in Warren Co., N. C., in Fairfax, Loudon, and Alexandria counties in Virginia, and in other places.

Believing that the present opportunity of securing territory under the Alden patents is one of such lucrative character as can rarely offer twice in a lifetime, we sincerely recommend all who think of acting upon it to lose no time in securing their chosen territory, and taking an early stand in the new market of ALDEN FRESH-PRESERVED FRUITS AND VEGETABLES. Patents in foreign countries are now being secured.

As the establishment of evaporating factories in every rural district is to be of prime importance to farmers, it will be generally practicable and advantageous to organize local joint stock companies (on the principle of the successful butter and cheese factory system), in which all those interested can participate. The Alden Fruit-Preserving Company, of New York, will be prepared to receive consignments, make advances, and sell on commission, at customary rates.

OFFICIAL AND PRESS REPORTS.

Extract of Letter received from M. C. SPAULDING, of Dubuque, Iowa, dated Nov. 7th, 1870.

Your invention seems destined to work a complete revolution in the modes of preserving fruits and various articles of food.

It is truly a benefaction to the race, for it will result in rendering the products of all climes common and accessible to all others; the tropics will by this process exchange its fruits with the temperate and frigid zones, and every man will become a resident of every clime, as far as its particular fruits are concerned.

Winter will be partially converted into summer. The poor can enjoy some of the winter luxuries of the rich.

Extract from Report of Farmers' Club, American Institute, N. Y.

* * * * No chance for dust, flies, bees, or any other insect to interfere with it, and is perfectly clean, as all the work is done by machinery. This is believed

to be the first attempt to preserve tomatoes by evaporating the water from them, or by any other way except by canning. It is well known that most fruits contain some 80 per cent. water, but the tomato contains about 28 quarts water in every bushel. This machine is intended to evaporate and carry off nearly 3,000 quarts water from tomatoes every twenty-four hours, leaving the tomatoes in fine condition for pressing and packing, with all the saccharine matter undisturbed, feeling as soft as a preserved fig, which it very much resembles, and will in that condition keep a very long time, retaining all their natural flavor, color, and taste, and when soaked in cold water and cooked are equal to fresh tomatoes, having much less acid than the canned tomatoes, and of much finer flavor—and free from the poisonous effects of the tin, and can be sold for one-half the price. There is no one fruit more extensively used in this country than the tomato, and with this new invention thousands of acres of land will be brought into requisition to supply the demand, which will soon be largely increased, as the cost of transportation when evaporated will be very small when compared to the canned tomatoes; as it takes thirty-three cans to hold a bushel of tomatoes, weighing, when packed for transportation, nearly 100 pounds against 4 pounds—the weight of one bushel evaporated tomatoes. The peaches preserved by evaporation are as fragrant as a fresh basket of ripe peaches, and when cooked will have the same rich taste and aroma. The evaporated apples look as white and clean as a fresh cut apple, and when cooked will have all the taste and flavor of the natural fruit—quite a different article from the dried apple in every respect. Evaporated potatoes, onions, cabbages, parsnips, and turnips when cooked are precisely like the fresh article. Sweet corn, green peas, and all other vegetables obtain the same result by passing through the evaporating process, as also the strawberry, raspberry, and all other small fruit. No fruit need now be lost even in the remotest parts of our country for want of a market to dispose of it at a fair price.

From N. Y. Daily Tribune, Oct. 21st, 1870.

* * * * * Mode is by evaporation produced through forced currents of rarefied air, graduated from a low to a higher temperature, following a well recognized law of nature, and producing quite different results from the old process of kiln-drying. * * * * * The cores and skins, as well as the windfall and other refuse fruit, are converted into jelly without the use of sugar, by reason of a chemical change wrought through the process. * * * * * Have eaten some of the sauce and pie made from the prepared apple, and were unable to tell any difference between it and that made from fresh fruit.

From N. Y. Independent, November 3d, 1870.

We copy from the *N. Y. Tribune*, in another column, an article on Alden's new process of preserving fruits, vegetables, meats, etc.

Having visited the store of the Company, at 123 Chambers Street, in this city, and examined their fruits, etc., in bulk, we are free to commend it as a truly wonderful discovery.

We tasted many of the articles, as prepared for the table, and were unable to detect any difference in taste and flavor from those freshly gathered; many of

them, too—such as apples, peaches, berries, etc.—were prepared with one-half the sugar required for fresh fruits. The Company maintain that, after paying the producer a very large profit, all articles can be furnished at a far less price than by any other process. In view of the almost unlimited foreign demand for our fruits at medium prices, it would seem that the new process would be the means of adding largely to our export products.

We noticed, while in the office of the Company, several persons from various sections negotiating for State and county rights and machinery.

From the New York Weekly Tribune, Oct. 26th, 1870.

[The following extract relates to the operations of Mr. Alexander Palmer, the well-known fruit-grower, of Modena, N. Y., under the Alden patents. Mr. Palmer, last year, purchased the right for his county (Ulster) and erected a factory with two evaporators, which were run on tomatoes, apples, peaches, sweet and northern potatoes, sweet corn, onions, etc., with satisfactory results. The Agricultural Editor of the *Tribune* visited Mr. Palmer's factory in the fall, and reported in his paper as follows:]

"ALDEN'S EVAPORATING PROCESS.—Charles Alden, of Newburgh, N. Y., has been for ten or twelve years known as the leading inventor in all methods of preserving juicy substances of food by removing the water of the fruits, leaving only the solid portions. He was of great use to the army in our war, by devising methods of supplying vegetables and fruits to the camps in a form that could be transported great distances and kept a long time. Within a year, he has perfected a process which must prove of very great importance to all fruit-growing sections, that are not in direct and easy communication with great cities. * * * We found a building about 60x30, two stories high, and costing some \$800 or \$1,000. Under a shed at one end is a boiler, such as is used to make steam for a 12-horse power engine. It consumes about half a ton of coal in a day of fourteen or sixteen hours, when 100 bushels of fruit are dried. The most of the steam is taken by a 2-inch pipe into the building, where it passes into a very long coil of inch tube, such as is used in warming houses by steam. There are 3,000 feet of a tube in this coil, and it is enclosed in a box or chamber only a little larger than the coil. Another pipe from the boiler takes part of the steam to a small engine, two or three horse-power, which drives a fan-wheel. This carries a strong current of fresh air to coil, which immediately becomes heated to about 170° or 180°, and at this temperature is driven into the evaporating chamber. This is vertical, 15 feet high, and 5x5 feet in dimensions. It is furnished with four endless chains, that, by a crank and ratchet-wheel, move inward and down the evaporator. At intervals of from six to twelve inches on these chains are brackets on hinges, that swing out as the chain moves over the top edge. These are to support the sieves, made with a light frame around a net-work of tinned wire, on which the fruit is laid. One bushel can be spread on each sieve. It is laid on the brackets on the chains at the top of the evaporator; then a revolution of the crank lowers it six inches, and another set of brackets come over to receive the next sieve, and so on, the sieves travelling the whole distance down the evaporator at stages of six inches at a time. With the force now at work, a



tray of pared and sliced apples is made ready every nine minutes. The temperature at the lower end of the evaporator, where the air is just off the coil, is 170° , sometimes falling to 165° . At the upper end, where the apples are raw, the heat is about 120° . Thus from 50° to 60° of heat are absorbed in carrying off the moisture from the apples. The quantity of apples in an evaporator, 15 feet high, with one-bushel driers at intervals of six inches, is 30 bushels. At the bottom are two hands who open a door in the evaporator, and take out a sieve of fruit as often as one is added to the top—that is, every nine minutes. A bushel gives ten pounds of the evaporated fruit. Tomatoes yield four pounds to the bushel. During the day, fair apples, which in Ulster County can be bought for 30 cents a bushel, are handled. At night, all the cores and skins, and the windfalls and bruised apples, which are bought at 20 cents a bushel, are sliced by machinery and placed in the evaporator. These are taken to New York, and converted into apple jelly of a fine quality, and apple marmalade. Being dehydrated so rapidly and so soon after being pared, the apples do not become discolored, but come out very white and clean, and, after being soaked, the slices look and taste like fresh pared fruit, and can be made into an apple pie which any one would say was composed of fresh apples from the barrel. On account of the rapidity of the operation and the peculiar action of the heated air, fruit handled in this way does not become acid. A pie can be made with far less sugar than is used on fruit prepared in the old way. The evaporating begins before the fermenting process has time to start.

With a boiler such as Mr. Palmer has, steam can be made for three or four coils with a little additional coal. At present he has two evaporators, one running on apples and the other on tomatoes. He handles 100 bushels of fruit in a day, giving 20 to 30 cents for apples and 35 cents for tomatoes. The process costs as much as the fruit. Thus, 30 for the apples, 30 for drying—60 cents. For this outlay he gets ten pounds of fruit, worth 15 cents a pound, \$1.50; deduct cost, 60 cents, leaves 90 cents, profit, without reckoning the income from jelly and marmalade.

The expense of the building may be from \$500 to \$1,000. Boiler, engine, and coils, for the two evaporators, cost about \$3,000; the chains, lumber, and labor, for the two evaporators, say \$1,000; about \$5,000 for a dry-house ready for work. By using a portable farm-boiler and engine, and a house already standing, the cost may be lowered to less than \$1,500. Such an establishment can begin in the summer on berries, continue on peaches and tomatoes, and run on apples till Christmas. In the South, the sweet potato and the fig might make such a house more profitable than in an apple country.

The most noteworthy feature of this process is the facility it gives for preserving *all* the fruit of the neighborhood, the misshapen and bruised apples as well as the fair and marketable. At present, only the choice of our orchards is made available.

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